

## **ABSTRACT OF THE DISCLOSURE**

A method and system for hydrogen production in which a feedstock of at least one biodegradable solid is introduced into a first stage anaerobic bioreactor and a liquid effluent formed. The liquid effluent is transferred into a second stage anaerobic bioreactor having a plurality of hollow semipermeable fibers having an outer surface coated with a biofilm formed by at least one hydrogenogenic bacteria, which forms hydrogen gas within the lumen of the hollow semipermeable fibers. The hydrogen thus produced is removed from the lumen of the hollow semipermeable fibers.